

We claim:

1. An isolated nucleic acid molecule which encodes a tumor rejection antigen precursor "TRAP" having an amino acid sequence of a TRAP encoded by a nucleotide sequence selected from the group consisting of SEQ ID NO: 21, SEQ ID NO: 23 and SEQ ID NO: 25.
2. An isolated nucleic acid molecule having a nucleotide sequence which encodes a tumor rejection antigen precursor, said isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of SEQ ID NO: 21, SEQ ID NO: 23 and SEQ ID NO: 25.
3. The isolated nucleic acid molecule of claim 1, wherein said nucleic acid molecule is a cDNA molecule.
4. The isolated nucleic acid molecule of claim 1, wherein said nucleic acid molecule is a genomic DNA molecule.
5. The isolated nucleic acid molecule of claim 1, wherein said nucleic acid molecule is an isolated mRNA molecule.
6. An expression vector comprising the isolated nucleic acid molecule according to claim 1 operatively linked to a promoter.
7. An expression vector comprising the isolated nucleic acid molecule according to claim 3 operably linked to a promoter.

8. The expression vector according to claim 6, wherein the promoter is an inducible promoter.
9. A cell line or cell strain transfected or transformed with the expression vector of claim 6.
10. A cell line or cell strain transfected or transformed with the expression vector of claim 7.
11. The cell line according to claim 9, wherein said cell line is a eukaryotic cell line.
12. The cell line according to claim 11, wherein said cell line is selected from the group consisting of a human cell line, a rodent cell line and a simian cell line.
13. The cell line according to claim 12, wherein said cell line is selected from the group consisting of a COS cell line and a CHO cell line.
14. The cell line according to claim 10, wherein said cell line is a eukaryotic cell line.
15. The cell line according to claim 14, wherein said cell line is selected from the group consisting of a human cell line, a rodent cell line or a simian cell line.
16. The cell line according to claim 15, wherein said cell line is selected from the group consisting of a COS cell line and a CHO cell line.

- 5
- 10
- 15
- 20
- 25
17. A method for determining presence of cytolytic T cells specific for complexes of an HLA molecule and a peptide derived from the protein encoded by the isolated nucleic acid molecule of claim 1 in a CTL-containing sample, comprising contacting said sample with cells which present said complexes on their surface, and determining (i) proliferation of cytolytic T cells, or (ii) lysis of cells presenting said complexes as a determination of said cytolytic T cells in said sample.
18. The method according to claim 17, comprising determining proliferation of cytolytic T cells by measuring tumor necrosis factor release.
19. The method according to claim 17, comprising determining lysis of said cells by determining release of a radiolabelled substance from said cells.
20. The method according to claim 19, wherein the radiolabelled substance is ^{51}Cr .
21. The method according to claim 17, wherein said cells which present said complexes have been transfected or transformed with at least one of (i) a nucleic acid molecule which codes for an HLA molecule and (ii) the isolated nucleic acid molecule of claim 1.
22. The method according to claim 17, wherein said cells have been transfected or transformed with both of (i) a nucleic acid molecule which codes for an HLA molecule and (ii) the nucleic acid molecule of claim 1.
23. An isolated tumor rejection antigen precursor encoded by the isolated nucleic acid molecule of claim 1.

24. An isolated tumor rejection antigen precursor encoded by the isolated nucleic acid molecule of claim 3.

5 25. A cell line or cell strain transfected or transformed with the isolated nucleic acid molecule of claim 1.

26. A polytope comprising a plurality of tumor rejection antigens wherein said antigens are derived from a tumor rejection antigen precursor selected from the group consisting of MAGE-C3, MAGE-B5, and MAGE-B6 tumor rejection antigen precursors.

27. The polytope of claim 26 comprising at least one other tumor rejection antigen derived from a TRAP selected from the group consisting of MAGE-C1 and MAGE-C2 TRAPs.

28. Kit useful in a polymerase chain reaction based assay, comprising an oligonucleotide having a sequence of nucleotides 175-195 of SEQ ID NO: 21 and an oligonucleotide having a nucleotide sequence that is complementary to nucleotides 711-731 of SEQ ID NO: 21.

29. Kit useful in a polymerase chain reaction based assay, comprising an oligonucleotide having a sequence of nucleotides 370-394 of SEQ ID NO: 23 and an oligonucleotide having a nucleotide sequence that is complementary to nucleotides 682-705 of SEQ ID NO: 23.

30. Kit useful in a polymerase chain reaction based assay, comprising an oligonucleotide having a sequence of nucleotides 114-137 of SEQ ID NO: 25 and an oligonucleotide having a nucleotide sequence that is complementary to nucleotides 510-532 of SEQ ID NO: 25.

5

31. Method for determining expression of a MAGE-C3 gene in a sample, comprising contacting said sample with (i) an oligonucleotide having a sequence set forth by nucleotides 175-195 of SEQ ID NO: 21 and (ii) an oligonucleotide having a sequence that is complementary to nucleotides 711-731 of SEQ ID NO: 21, under conditions favoring hybridization of the sequences of (i) or (ii) to an MAGE-C3 coding sequence, carrying out polymerase chain reaction and determining expression product to determine presence of an MAGE-C3 coding sequence in said sample.

32. Method for determining expression of a MAGE-B5 gene in a sample, comprising contacting said sample with (i) an oligonucleotide having a sequence set forth by nucleotides 370-394 of SEQ ID NO: 23 and (ii) an oligonucleotide having a sequence that is complementary to nucleotides 682-705 of SEQ ID NO: 23, under conditions favoring hybridization of the sequences of (i) or (ii) to an MAGE-B5 coding sequence, carrying out polymerase chain reaction and determining expression product to determine presence of an MAGE-B5 coding sequence in said sample.

33. Method for determining expression of a MAGE-B6 gene in a sample, comprising contacting said sample with (i) an oligonucleotide having a sequence set forth by nucleotides 114-137 of SEQ ID NO: 25 and (ii) an oligonucleotide having a sequence that is complementary to nucleotides 510-

532 of SEQ ID NO: 25, under conditions favoring hybridization of the sequences of (i) or (ii) to an MAGE-B6 coding sequence, carrying out polymerase chain reaction and determining expression product to determine presence of an MAGE-B6 coding sequence in said sample.